

TWO NEW SPECIES OF DIPLOTAXIS FROM MEXICO (COLEOPTERA: MELOLONTHIDAE)

LEONARDO DELGADO¹ AND FABRICIO CAPISTRAN²

^{1,2}Instituto de Ecología, A.C., Apdo. Postal 63,
91000 Xalapa, Veracruz, México, and

²Parque de la Flora y Fauna Silvestre Tropical,
Apdo. Postal 57, Catemaco, Veracruz, México

Abstract.—Two new Mexican species of *Diplotaxis* from Veracruz state are described. Modifications to Vaurie's keys to the genus are included to allow their identification.

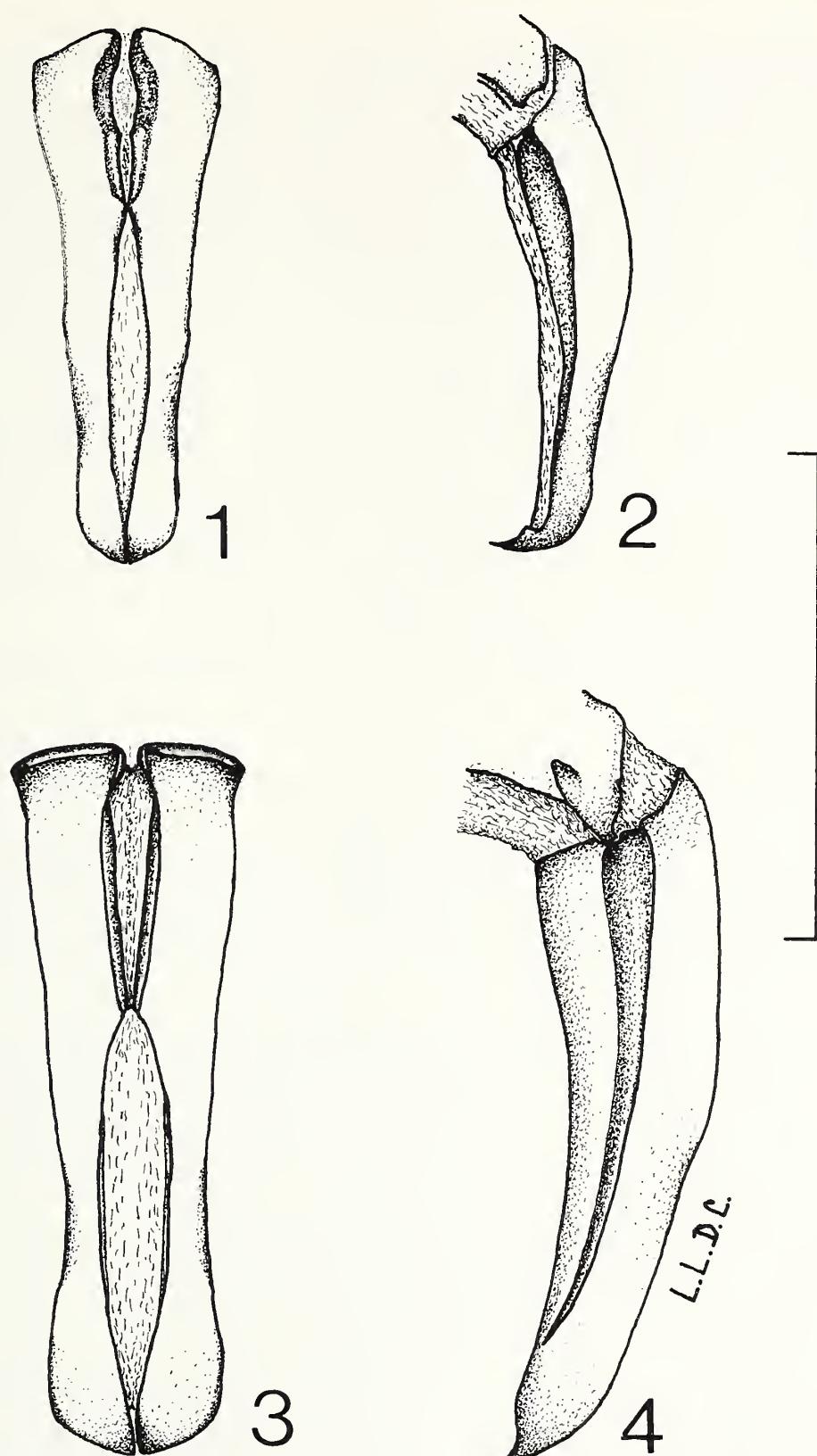
The American genus *Diplotaxis* includes 221 species, most of which (about 77%) are distributed in Mexico (Vaurie, 1958, 1960, 1962; Delgado-Castillo, 1990). However, only 18 species have been cited from Veracruz state: six are localized in the lowland tropical rain forest with four of these six extending their distribution to Central America; five others occur principally in areas above 1,500 m; two others are distributed almost exclusively in the cloud forest (one of which, *D. veracruzana* Vaurie, is a Veracruz endemic); and five others with various habitat preferences (*D. aenea* Blanchard, *D. angustula* Moser, *D. atramentaria* Bates, *D. coriacea* Bates and *D. puberea* Bates) seem to be very scarce in Veracruz and need to be confirmed.

In this paper we describe two new species from Veracruz state, and incorporate them into Vaurie's keys.

Diplotaxis xalapensis, new species (Figs. 1–2)

Type material. Holotype ♂, labeled: “MEXICO, Veracruz, Xalapa, Rancho Guadalupe, Km 2.5 Antigua carr. a Coatepec. Bosque mesófilo–cafetal. Alt. 1,360 m, Luz. 13-II-1991. L. Delgado, col.” Allotype ♀ labeled as holotype, except: 6-7-III-1992, F. Capistrán, J.R. Hernández y L. Delgado, cols. Paratypes 54 ♂♂, 29 ♀♀. One male labeled as holotype. 32 ♂♂, 21 ♀♀ labeled as allotype. 17 ♂♂, 8 ♀♀ labeled as holotype except: 8-III-1991 (1♂), 14-III-1991, L. Arellano, col. (4♂♂); 8-IV-1991 (1♂); 10-III-92, P. Rojas, col. (1♂); 20-III-92, F. Capistrán y E. Santos, Cols. (10♂♂, 7♀♀). 4 ♂♂ labeled: “MEXICO, Veracruz, Xalapa, Briones, Alt. 1,360 m. 28-III-1991. M.A. Morón, col.” One female labeled Mexico: Veracruz, 2 km al NE de Calcahuasco. AH. 1,650 m Bosque mesófilo 4-V-92 a la luz, Capistrán y Delgado, cols.

Holotype and four paratypes deposited at the Instituto de Biología–Universidad Nacional Autónoma de México (Mexico City), paratypes deposited at the following collections: British Museum Natural History (London), Muséum National d’Histoire Naturelle (Paris), Zoologisches Museum Humboldt Universität (Berlin), Canadian National Collection (Ontario), United States National Museum (Washington), American Museum of Natural History (New York), Museu de Zoologia da Universidade de São Paulo, Museu Nacional da Universidade Federal do Rio de Janeiro, Universidad Nacional de Venezuela (Maracay), Museo Argentino de Ciencias Naturales (Buenos Aires), Laboratorio Natural Las Joyas–Universidad de Guadalajara (Jalisco),



Figs. 1-4. New species of *Diplotaxis*. 1-2. *D. xalapensis* 1. Parameres, frontal view. 2. Parameres, lateral view. 3-4. *D. squamisetis*. 3. Parameres, frontal view. 4. Parameres, lateral view. Scale = 1 mm.

Museo de Historia Natural de la Ciudad de México, Instituto de Ecología (Veracruz), M. Bunalski (Poznan), H. & A. Howden (Ontario), B. D. Gill (Ontario), B. C. Ratcliffe (Nebraska), W. B. Warner (Arizona), S. McCleve (Arizona), P. K. Lago (Mississippi), A. A. De Ascencao (Merida), A. Martínez (Salta), G. Halfster (Veracruz), M. A.

Morón (Veracruz), J. Blackaller (Mexico City), J. R. Hernández (Veracruz), F. Capistrán (Veracruz) and L. Delgado (Mexico City).

Description. Holotype male. Length 7.2 mm; elytral maximum width 3.0 mm. Body elongate and flattened; front of head, disc of pronotum, abdomen and pygidium metallic green; elytra opaque green, sericeous; clypeus, marginal regions of pronotum and scutellum brilliant reddish; venter and legs yellowish-red. Clypeus trapezoidal, as long as the front, with obtuse front angles, broadly emarginate anteriorly and sides indented in front of eyes; surface deeply concave, except for a tumid small central area; some short setae present only behind the margins and with scarce, minute setae on disc; fronto-clypeal suture well marked and sinuate at middle; clypeal surface densely rugose. Front with anterior half abruptly descending to clypeus, with scarce medium-sized punctures and concave at central region, posterior half flattened and with rugose punctuation; transverse eye diameter almost $0.25 \times$ as wide as head. Antenna 10-jointed. Labrum slightly concave with dense punctures, level with and $0.75 \times$ the length of the reflexed underside of clypeus; mandibles slender; mentum slightly convex, with anterior declivity marked by transverse sharp, setiferous ridge; last article of maxillary palpus not impressed dorsally.

Pronotum hexagonal; fore angles acute, lateral angles obtuse and situated nearly at the middle, hind angles obtuse; pronotal surface with longitudinal mesial furrow and four irregular depressions each side of midline as follows: one on anterolateral corner, one lateral, one on posterolateral corner and one central, last two larger than the others; pronotal surface irregularly elevated with large punctures, some of them confluent, the punctuation between them becoming finely reticulate to marginal regions; pronotum laterally and basally with cariniform, narrow margin, with the adjacent region depressed, basal margin crenate. Scutellum with scarce medium-sized punctures.

Elytra longer than wide (1:0.66), with irregular rugose swellings, many of them branching off from convex costae; punctures smaller than those on pronotum, irregularly placed and with scarce, minute setae overall (only visible at high magnification); striae not evident, except the two outer ones; marginal setae scarce and very short, present only on basal quarter. Abdomen laterally rounded; propygidium not grooved above pygidium; abdominal sternites 1–5 subequal in length, with long setae more abundant laterally; pygidium wider than long and with coarse and deep punctures, some confluent, and with setae more or less abundant, those on apical half longer.

Protibiae tridentate, basal tooth scarcely marked and situated in the distal half; claws slightly curved, cleft subapically, tooth entire and shorter than apex; tarsi longer than respective tibiae; basal mesotarsomere almost as long as second one; metacoxal plates margined laterally and truncate; metafemora straight and slender; metatibial spurs slender, long and acute; basal metatarsomere shorter than the second one and of the same length as the longest spur.

Genitalia with basal piece a little longer than parameres, which are jointed on inner margin at basal third and abruptly bent at the apex (Figs. 1–2).

Allotype female. Length 7.5 mm; elytral maximum width 3.2 mm. Differs from holotype in the following respects: elytra with metallic reflections; clypeus with only the marginal regions yellowish-red, a little shorter than the front, scarcely reflexed, the anterior margin truncate and the front angles rounded, half posterior of the front a little convex and with punctures not confluent; transverse eye diameter $0.20 \times$ as

wide as head; labrum as long as the underside of clypeus; last article of maxillary palpus shorter; pronotum with fore angles almost right, with the surface almost evenly elevated, with punctures not confluent and the reticulated punctuation reduced; fifth abdominal sternite shorter than each sternites 1–4; pygidium with coarser and deeper punctures almost crater-like; femora wider and robust; protibia wider and with the basal tooth clearly marked, meso and metatibiae more flared out at apex; metatibial spurs wider; protarsi shorter; basal metatarsomere shorter than the longest spur; claws shorter, tooth of the same length as the apex, obliquely truncate and more separated from the apex.

Variation. Males, length: 5.8–7.7 mm, elytral maximum width: 2.6–3.5 mm; females, length 6.1–7.7 mm, elytral maximum width 2.7–3.6 mm. In the males the color of elytra is generally sericeous green; and in the females metallic-green; the brilliant reddish color on the marginal regions of clypeus and pronotum varies a little in extent. Setae on clypeus, scutellum and elytra varies from more or less abundant to nearly absent; pygidial punctures vary in density and depth; length of the basal metatarsomere varies from a little longer to shorter than the longest metatibial spur. The shape of clypeus, the transverse eye diameter, the length of labrum, the last article of palpus maxillary, the pronotal fore angles and the legs are considered dimorphic characters.

Type locality. Km 2.5 Antigua carr. a Coatepec, Rancho Guadalupe, Xalapa, Veracruz, Mexico.

Remarks. *D. xalapensis* presents most of characters given by Vaurie (1960:191) to the “Trapezifera” group as: clypeus hairy (only behind front edge), eye large, antennae 10-jointed, mandibles small, elytra about three times longer than the pronotum, abdomen not ridged laterally, propygidium without groove, metacoxal plates margined laterally and not angulate, and basal tooth of protibiae in the distal half. However *D. xalapensis* shows characters not shared with other species of this group, such as the unevenly elevated dorsal surface, the hexagonal shape of pronotum, and the elytral punctuation and microsculpture with a metallic or sericeous cast, which give it an unusual and distinctive appearance, and the shape of the claws.

A species that shows the same elytral punctuation and microsculpture is *D. aurata* Bates, which differs from *D. xalapensis* by the labrum longer than underside of clypeus, the pronotum arcuate near middle, and the elytra with long, erect setae. We key out *D. xalapensis* in the “trapezifera” group for convenience, however, this species seems not to have close affinities to this group. Rather it shows possible relationships with *D. aurata*, a species only cited from Guatemala.

D. xalapensis is an early flying species, and this phenology could explain why it has not been collected before, since the area has been visited by many entomologists over a long time.

Etymology. This species is dedicated to the City of Xalapa de Enríquez, where it was collected, and one of the classical localities of the faunal work “Biología Centrali-Americana.”

The key to the “trapezifera” group proposed by Vaurie (1960:193), is modified as follows to incorporate *D. xalapensis*:

27 Pronotum with sides strongly arcuate behind middle and hind angles rounded off without angulation; side margins of clypeus almost parallel to front; Guerrero, Puebla *incisa*

27' Pronotum with sides scarcely arcuate or angulate, and hind angles distinctly angulate; side margins of clypeus converging obliquely to front; Durango, (Hidalgo?), Veracruz 27a

27a Color wholly light red; clypeus with dentiform front angles; elytral striae clearly distinguished; Durango, (Hidalgo?) *saltensis*

27a' Color of the elytra and the most of the pronotum and front green, marginal regions of clypeus reddish; clypeus with obtuse or rounded front angles; striae of the elytral disc not distinguished; Veracruz *xalapensis*

Diplotaxis squamisetis, new species
(Figs. 3-4)

Type material. Holotype ♂, labeled: "MEXICO: Veracruz, Los Tuxtlas, Sierra de Santa Marta, Ocotal Chico. 17-18-VII-1982. Alt. 700 m, colecta nocturna. H. Pérez, col." Allotype ♀, labeled: "MEXICO: Veracruz, Catemaco, Pipiapan, Parque de la Flora y Fauna Silvestre Tropical. 16-IV-91. Alt. 600 m, selva mediana perennifolia/ comiendo hojas de *Guarea glabra* (Meliaceae). O. Aquino y F. Capistrán, cols." Paratypes 6♂♂, 1♀. 2♂♂ labeled as holotype; 1♀ labeled as allotype, except: "13-15-IV-1991. Luz ultravioleta. G. Cabrera y F. Capistrán, cols"; 4♂♂ labeled: "MEXICO: Veracruz, Estación Biología "Los Tuxtlas," 250', V-20-1983/ C.W. & L. O'Brien & G.B. Marshall."

Holotype and allotype deposited at the Instituto de Biología, Universidad Nacional Autónoma de México (Mexico City). Paratypes deposited at the following collections: W. B. Warner (Arizona), S. McCleve (Arizona), M. A. Morón (Veracruz), F. Capistrán (Veracruz) and L. Delgado (Mexico City).

Description. Holotype male. Length 9.3 mm, elytral maximum width 4.6 mm. Body ovate, robust, reddish-brown, densely clothed with yellowish scale-like setae. Clypeus rectangular, its length nearly equal to $0.33 \times$ the cephalic length, slightly and broadly emarginate in front and with the fore angles rounded; punctuation large and dense with erect scale-like setae. Fronto-clypeal suture without setae, except at center; frons with punctuation similar to that of clypeus but with longer and semierect setae; transverse eye diameter equal to $0.25 \times$ the cephalic width. Labrum twice longer than underside of clypeus and with dense, fine punctures; mandibles robust; mentum almost flat, with lateral depressions posteriorly and with anterior declivity little marked. Antennae 10-jointed, club reddish; last article of the maxillary palpi not impressed.

Pronotum evenly rounded laterally, wider at middle, fore and hind angles obtuse; pronotal surface with dense setiferous punctures, setae erect directed to midline, surface between the punctures finely punctate; anterior margin with long, erect setae; posterior margin with short, decumbent setae. Scutellum densely punctate and with decumbent setae overall.

Elytra longer than wide (1:0.70); punctuation similar to that of pronotum; striae little evident; elytral surface with setae shorter than the length of scutellum, most of them decumbent; some erect setae on the costae and sutural interval. Abdomen ridged laterally; propygidium not grooved; abdominal sternites of equal length, clothed with decumbent setae and with a transverse row of erect setae; pygidium a little wider than long, densely punctate-setiferous, setae long semierect and short decumbent.

Protibiae tridentate, teeth placed in the distal half, basal tooth slightly marked; protarsi shorter than protibiae; mesotarsi longer than mesotibiae; first and second mesotarsomere of same size; basal metatarsomere of same length as the longest metatibial spur; claws abruptly bent and subapically cleft, tooth wider than the apex but of the same length and with distal half broadly separated from the apex. Genitalia with basal piece a little longer than parameres, which are jointed behind the middle and widened on apical third (Figs. 3-4).

Allotype female. Length 9.1 mm; elytral maximum width 4.9 mm. Differs from holotype in the following respects: pygidium a little longer and the basal metatarsomere shorter than longest metatibial spur.

Variation. Female, length 8.6 mm; elytral maximum width 4.5 mm. Males, length 6.8-8.4 mm; elytral maximum width 3.4-4.3 mm. The color of the elytra varies from reddish-brown to reddish, the density of the setae varies a little, possibly by abrasion, and the apex of clypeus is almost truncate in the smaller specimens.

Type locality. Ocotl Chico, Sierra de Santa Marta, Los Tuxtlas, Mexico.

Remarks. *Diplotaxis squamisetis* does not fit into any presently defined groups of the genus. The presence of dense vestiture over all of the body, formed by decumbent, semierect and erect yellowish scale-like hairs is exclusive to this species, and very different from all other setiferous species of *Diplotaxis*, as the species of the "puberula," "pilipennis" and "pilifera" groups. In the first two groups the vestiture is formed by erect and fine setae and in the last one by white, short, scale-like setae apressed to the surface. Other species with thick scaly vestiture are *D. clypeata* Bates and *D. mus* Fall, the former differing principally from *D. squamisetis* by the smaller eyes, dark antennal club, lack of pubescence on elytral striae, shape of clypeus and different vestiture (similar to that of the "pilifera" group); the second one differing by the white, scaly vestiture apressed to surface, laterally rounded abdomen, straight-sided pronotum, and rounded clypeus.

The food plant, *Guarea glabra* Vahl (Meliaceae) is a deciduous tree, with height of 3-15 m, ranged from Mexico to Colombia, Venezuela and Ecuador. In the region of "Los Tuxtlas," Veracruz, Mexico, it is a dominant species within the forest (Ibarra-Manriquez, 1985).

Etymology. The specific epithet refers to the conspicuous scale-like setae over all of the body.

The key to species and species-groups of *Diplotaxis* in Vaurie (1960:188) should be modified as follows to incorporate *D. squamisetis*.

87(86) Clypeus rounded from side to side as a semicircle, its front margin not reflexed; Arizona; Chihuahua	<i>mus</i>
87' Clypeus trapezoid, quadrate or rectangular in shape, angulate at sides, front margin reflexed; central, southern and eastern Mexico	87a
87a Dorsal vestiture formed by yellow scale-like setae, most of which are semierect; clypeus rectangular with the front angles rounded, its frontal margin slightly re- flexed; labrum twice longer than the reflexed under side of clypeus; Veracruz	<i>squamisetis</i>
87a' Dorsal vestiture formed by white, depressed scales; clypeus trapezoid or quadrate with the front angles obtuse or straight, its front margin strongly reflexed; labrum of the same length or shorter than under side of clypeus; central and southern Mexico	88

ACKNOWLEDGMENTS

The authors offer thanks to S. McCleve for his valuable comments on the manuscript, to W. B. Warner, S. Santiago and J. Blackaller for the loan of specimens, to M. A. Morón for the donation of specimens collected by him, to O. Aquino for the determination of the host plant and his aid during collecting trips, to G. Cabrera, L. Arellano, P. Rojas, E. Santos and J. R. Hernández for assistance in the collects, to R. Novelo for the revision of our English version.

This work represents contribution No. 13 of the "Studies of the Coleoptera associated with the rhizosphere of the grass crops in Mexico" (P228CCOX891679) project supported by CONACYT, Mexico.

LITERATURE CITED

Delgado-Castillo, L. 1990. Dos nuevas especies mexicanas de *Diplotaxis* del grupo "Puberea" (Coleoptera: Melolonthidae; Melolonthinae). *Folia Entomol. Mex.* 78:61–70.

Ibarra-Manríquez, G. 1985. Estudios preliminares sobre la flora leñosa de la Estación de Biología Tropical Los Tuxtlas, Veracruz, México. Tesis. Fac. Ciencias, UNAM, México, 264 pp.

Vaurie, P. 1958. A revision of the genus *Diplotaxis* (Coleoptera, Scarabaeidae, Melolonthinae). Part 1. *Bull. Am. Mus. Nat. Hist.* 115:267–396.

Vaurie, P. 1960. A revision of the genus *Diplotaxis* (Coleoptera, Scarabaeidae, Melolonthinae). Part 2. *Bull. Am. Mus. Nat. Hist.* 120:161–434.

Vaurie, P. 1962. New synonymy for *Diplotaxis ebenina* from Martinique and new distribution records for *Diplotaxis* (Coleoptera: Scarabaeidae: Melolonthinae). *Coleopts Bull.* 16: 97–98.

Received 12 September 1991; accepted 30 April 1992.